

2006 CCRTS
THE STATE OF THE ART AND THE STATE OF THE PRACTICE
Achieving Decision Superiority at NATO Headquarters

Submission # C-110

Lessons Learned
C2 Concepts and Organizations
Policy

Orrick White

Centre for Operational Research
Directorate of Defence Analysis
Director General Strategic Planning
National Defence Headquarters
Ottawa, Ontario
K1A 0K2

Telephone: 613-995-6355
Fax: 613-992-5484

E-mail: White.OM@forces.gc.ca

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JUN 2006		2. REPORT TYPE		3. DATES COVERED 00-00-2006 to 00-00-2006	
4. TITLE AND SUBTITLE Achieving Decision Superiority at NATO Headquarters				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) National Defence Headquarters, Centre for Operational Research, Directorate of Defence Analysis, Ottawa, Ontario K1A 0K2, ,				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 36	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

ABSTRACT

In January 2005, NATO conducted its Crisis Management Exercise (CMX) to practice both existing and evolving crisis management concepts, procedures and arrangements. The CMX Experiment (CMX05), which paralleled the exercise, focused on improving Alliance Decision Superiority at the Political/Military level. To achieve this goal, Allied Command Transformation (ACT) conducted three independent and distinct experiments: 1) Crisis Situational Awareness, 2) Effects Based Operations at the Political Strategic Level and 3) Cooperation with Non-NATO International Actors.

While it was recognized that all three experiments were important for further developing Alliance Decision Superiority, the main level of effort for the Experimentation Team was focused on Crisis Situational Awareness. For that experiment, ACT created a conceptual Crisis Management Fusion Centre (CMFC) for NATO HQ that was designed to improve situational awareness through the use of collaborative tools to develop a common NATO Strategic Picture (NSP).

The following preliminary hypotheses related to the emerging CMFC concept were explored:

- If NATO establishes a cross-functional organization then it will increase the value of information available during a crisis.
- If crisis management processes are conducted through the use of a Collaborative Information Environment (CIE), then staff support to committees will be improved.
- If all relevant crisis information is presented in an accessible and intuitive way, then personnel will share a better quality understanding of the crisis, NATO's posture, and potential options for Alliance response.

This paper reports many of the outcomes and lessons learned from the CMX 05 Experiment and the follow-on Fusion Centre Limited Objective Experiment. The content of the paper is derived from experience as an analyst in both experiments and from the official reports written by the ACT experiment analysis team. The findings will help to demonstrate the importance of turning concepts into practice and how establishing synergies between theory and practice are essential for achieving effective change.

* This paper is not for attribution

INTRODUCTION

Over the past two decades, the members of the NATO Alliance have faced dramatic changes in the international environment and the context within which they pursue security in an uncertain world. Threats of international terrorism, failed states, and the proliferation of weapons of mass destruction are quite different from the threats envisioned during the Cold War. As a result, the NATO Alliance, which was originally designed for large-scale conflict with the Soviet Union, has evolved to address the new security challenges.

Allied Command Transformation (ACT) was stood up in 2003 to grapple with military-security challenges and to explore technologies, organizations and processes that would help transform Alliance operations. By exploring new ways of operating, employing emerging technologies, or by using existing technologies in new and different ways, the Alliance can address security challenges more effectively. ACT has found that transformation efforts have a significant Political-Military dimension.¹ Since operational changes will not be fully optimized if they are not integrated with NATO Headquarters crisis management processes, experimentation at the Political-Strategic level must ensure that NATO Headquarters staffs and decision-makers are armed with the tools that will enable them to transform effectively. Experimentation helps to do this effectively.

At the 2004 Istanbul Summit, Heads of State and Government reinforced the importance that Allies capabilities must be modern, efficient and flexible and appropriate to the challenges faced by NATO now and in the future.² Since the end of the Cold War, crisis management has increasingly become an increasingly important element in NATO's role in the international community. In keeping with this shift, the NATO Crisis Management Fusion Centre (CMFC) has become one of the central elements of Allied Command Transformation's program to conduct experimentation in NATO Headquarters.

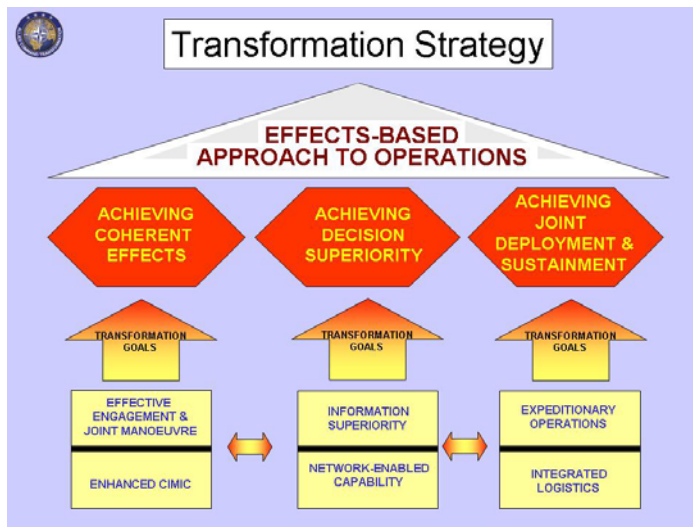
Once a year, Crisis Management Exercises (CMX) provide a venue to validate and/or test new and evolving crisis management organisations, arrangements, procedures, measures and communications. They are the sole opportunity for National and NATO political, military, and civil emergency authorities to simultaneously and collectively exercise the current political military consultation and decision-making machinery of the Alliance and to consolidate lessons learned from real operations.

As part of the Alliance's mission to explore and innovate, the Allies have permitted ACT to conduct experimentation during annual Crisis Management Exercises.¹ Experimentation in Crisis Management Exercises differs from other ACT experimentation efforts because the experiment is located not within an operational military headquarters, but in the political-military environment of NATO Headquarters. To date, the experimentation effort has been to provide new capabilities to the

Headquarters to enhance situational awareness and common understanding in the context of Crisis Management. ACT deployed a group of capabilities to NATO Headquarters during CMX 05 to explore how these conceptual goals may be achieved.

CONCEPT DEVELOPMENT AND EXPERIMENTATION AT THE POLITICAL/STRATEGIC LEVEL

Before discussing the specifics of the experiment, it is necessary to understand how ACT views concept development and experimentation at the political/strategic level. ACT's overall strategy for change is based on the Effects-Based Approach to Operations (EBAO). EBAO involves the comprehensive and integrated application of all instruments of Alliance power (both military and non-military) to create campaign effects that will achieve desired outcomes.³ EBAO embraces the complexity of an international environment that is information-rich and multidimensional, and provides an intellectual framework for effective Alliance capabilities in this setting. An EBAO starts with a political-strategic vision of an acceptable set of circumstances that defines the goal of Alliance engagement in a particular situation. This goal (the "end-state") provides the political guidance within which NATO's military commanders must operate. All experimentation efforts by Allied Command Transformation are framed by the Effects-Based Approach to Operations, and the transformation goals and objectives that support this vision of Alliance operations as seen below:⁴



Achieving three subsidiary transformation goals enables the proper exercise of an EBAO. These include:

- Decision Superiority
- Coherent Effects
- Joint Deployment and Sustainment

Experimentation in CMX 05 focused on the first of these subsidiary transformation goals – Decision Superiority. Earlier, during CMX 04, decision superiority was defined simply as making a “better decision faster.”⁵ However, one finding from the 2004 CMX experimentation effort was that unique concepts at the Strategic Level were required due to the dramatic difference between the operations of NATO Headquarters and the mostly operational level context of prior ACT experimentation venues. Subsequent concept efforts at ACT developed a more formal definition to be used in future political strategic experimentation efforts.⁶

During CMX 05 achieving Decision Superiority was found to be critically dependent on building a shared, common awareness of crisis situations. Shared situational awareness could be achieved by assessing all relevant information and knowledge within the strategic environment in the political, military, civil, and economic domains, and the ability to present and transmit this understanding in common or consistent manner. The pre-prototype CMFC, CIE, and NSP used during CMX 05 were all developed based on this conceptual perspective, and explicitly focused on providing the organisation, technology, and capabilities that would support shared situational awareness as part of a decision-superior NATO Headquarters.

CMX 05

From 26 January to 1 February 2005, NATO conducted the Crisis Management Exercise (CMX) 2005 to practice both existing and evolving crisis management concepts, procedures, and arrangements. The purpose of Crisis Management Exercises is to test the mechanisms that allow the Allies to generate consensus and manage emerging crises while training NATO Headquarters staff in the use of those mechanisms. These exercises occur once a year, but are planned in a 14-month cycle and provide the sole opportunity for national and NATO political and military authorities to collectively exercise the consultation and decision-making machinery that the Alliance has agreed to use when faced with an international crisis.

CMX 05 was the second time that Allied Command Transformation (ACT) conducted an experiment during a Crisis Management Exercise. The purpose of ACT’s involvement in Crisis Management Exercises is to “...explore new and different ideas in a future-oriented and relatively unconstrained way, while reinforcing central pillars of consultation, consensus, and the supremacy of political leadership that are at the very heart of the Alliance.”⁷ During CMX 05, ACT explored a number of new ideas at varying stages of development. Some of these ideas were at the earliest stage of investigation; with experimenters examining how emerging concepts with promise at the operational level might be integrated into NATO Headquarters crisis management. Findings from these early discovery experiments have been brought back to ACT for further concept development. Other ideas were built on the insights and recommendations of the first experimentation effort in CMX 04 and are more advanced. By January 2005, these concepts were realized in hardware, software, and organisational structures to such a level that ACT could “field” a set of pre-prototype decision-support

and situational awareness capabilities and observe how they might work in an experimental environment within NATO Headquarters.

DATA COLLECTION AND ANALYSIS

The analysis team was assembled specifically for CMX 05 and consisted of personnel from the Analysis, Concept Development, and Experimentation branches within ACT, as well as an external academic with extensive experience in the area of decision superiority. The analysts were physically co-located with members of the CMFC during their daily work. The primary mission of the analysis team during CMX05 experimentation was to act as overall experimentation *observers* and *data collectors*. Analysis of the CMFC and other capabilities was focused on assisting the development of the experimental concepts and capabilities to develop them for more rigorous hypothesis testing experiments in the future. To fulfil their mission, the analysts used a set of focused research questions designed to advance conceptual knowledge of the CMFC, CIE and NSP to guide their efforts of observing and recording the day-to-day operation of their assigned CMFC functional cells.

The aim of the analysis program for CMX 05 experimentation was not to evaluate, assess, judge, or critique any person or aspect of the NATO Headquarters crisis management process. Furthermore, experimentation did not judge or assess any decisions of the North Atlantic Council, recommendations by supporting committees, or indeed any other body within the organisation. It is extremely important to note that ACT's experimentation is not designed to explore the prerogatives and authorities of Permanent Representatives (PERMREP) or Military Representatives (MILREP), but rather to explore advanced capabilities and techniques that may help enable the effective exercise of those prerogatives, supporting decisions, and giving the Nations instruments with which they can exercise effective political control over the actions of the Alliance.

Observations by the analysis team were focused on further developing the experimental concepts and capabilities – not on proving or disproving the preliminary hypothesis stated earlier. The pre-prototype experimental capabilities were not yet ready to undergo causal evaluation of this sort during CMX 05. Although the hypothesis provided a framework for the relationship between the concepts, the true success of analysis in a preliminary hypothesis experiment like CMX05 depended on the ability of experiment analysts and SCDs to observe experimenters using the actual capabilities in close proximity to the Headquarters. The observations of the senior concept developers, experiment analysts, and staff observers and experimental CMFC personnel were integrated into the package of recommendations about how to proceed with the concepts and pre-prototypes. As such, the CMX analysis plan had several major objectives:

- Analyze and evaluate the effectiveness of The Crisis Management Fusion Centre (CMFC) and its constituent organisational elements
- Establish the requirements for proper knowledge management and fusion of information

- Evaluate the tools and procedures that constitute the Collaborative Information Environment
- Analyze and evaluate the NATO Strategic Picture.
- Recommendations to concept developers on how to improve ACT political-strategic concepts

The CMX experimentation team conducted a number of seminars during and after the exercise. The Senior Concept Developers (SCDs) participated in three seminars focusing on Decision Superiority and each of the experimental objectives in turn. The analysts took part in these seminars, using them to qualify their own assessments while ensuring that high-level experimental issues discovered by the SCDs were incorporated into their analysis. Finally, the analysis team conducted a number of debriefs of experiment participants at the conclusion of the event, including sessions with the CMFC staff and HQ staff observers to gather their observations immediately following the experiment.

EXPERIMENT OVERVIEW

Allied Command Transformation assembled a multinational team of 54 people to conduct the experiment. ACT provided 22 experimenters, analysts, network specialists, and support personnel from its own organisation. Additionally, nine Nations voluntarily provided 18 personnel that were assigned a number of experimental tasks, including manning the experimental Crisis Management Fusion Centre (CMFC), and observation of Headquarters processes.

Ten Senior Concept Developers (SCDs) and four contractors from eight nations were hired by ACT and provided high-level experience and guidance to the experimentation team and attended committee meetings to help understand crisis management working practices and to ensure that experimental concepts were properly focused on relevant issues. SCDs are former Ambassadors, Retired Flag or General Officers, or ranking officials in government or non-governmental organisations that have significant international experience and knowledge in concept development, experimentation efforts, and political/military affairs.

NATO Headquarters provided ACT with considerable access to observe exercise proceedings. Senior Concept Developers were able to observe all committee meetings and staff elements throughout the Headquarters. The main experimentation space from where the overall experiment was controlled and where most experiment operations were conducted was located in a facility adjacent to the main NATO Headquarters building. ACT also had several rooms within the Situation Centre (SITCEN), SACT Representative in Europe's (STRE) wardroom and offices for use by SCDs and observers so they could be in close proximity to the Headquarters staffs and committees. This distributed arrangement in multiple locations allowed for access to the Headquarters while encouraging the use of collaborative tools and networks to conduct business.

Both classroom and "hands-on" training was provided to experiment participants for three days prior to the start of the experiment. First, experimenters were briefed on

NATO organisations and structures, experimental concepts, and job descriptions in a seminar format. Next, all experimenters were brought to the CMFC location, given a laptop, and trained on the network with the experimental CIE and other tools. Immediately prior to the experiment, observers and SCDs left the CMFC location with their laptops and deployed to their locations in the Headquarters. The CMFC initiated operations by sorting through message traffic gathering information about the crisis, establishing communications with observers, and populating the NSP while observers and SCDs began attending meetings and liaising with Headquarters personnel.

EXERCISE AND EXPERIMENT SCENARIO

While the details of the scenario were not an integral element of the experiment, they did provide a large enough volume of complex information to challenge the CMFC concept and systems and create an environment that, though artificial, illustrated the complex nature of today's crises and the requirement for capabilities to sort and present a reliable picture of the emerging situation. The scenario was based on a fictitious island in the mid-Atlantic Ocean split between two competing states having a disputed region between them. The scenario also incorporated transnational terrorist organisations supporting one side. NATO had forces on the ground to monitor a peace agreement between the two states, but was faced with imminent escalation of tensions and possible conflict following a presidential assassination and political instability within one of the two countries. The scenario ended before large-scale conflict broke out, however a number of terrorist incidents occurred both within the disputed region and on the home territory of several Alliance members.

OBJECTIVES

Experimentation in CMX 05 had three experiment objectives; each was a discrete experiment. The objectives were derived from a combination of observations from experimentation in CMX 04, interviews with NATO Headquarters personnel, and recommendations provided by national representatives in pre-experiment planning conferences. They were as follows:

1. To evaluate the following preliminary hypothesis regarding enhanced crisis situational awareness: If NATO Headquarters possessed a dedicated Crisis Management Fusion Centre, enabled by a Collaborative Information Environment, and capable of producing a NATO Strategic Picture, then it would enhance Alliance crisis situational awareness thus contributing to smarter decisions fed by the latest and most timely information?
2. To examine how the requirements of an effects-based approach to operations relate to the content of NAC directives.
3. To explore how interaction between NATO and non-NATO organisations could contribute to Alliance Decision Superiority.

Due to the scope of this paper, we will address only the crisis situational awareness experiment. The crisis situational awareness experiment represented the bulk of ACT's efforts in CMX 05, with 22 dedicated experimenters and with the bulk of Senior Concept Developer time devoted to exploring the CMFC concept. These 22 experimenters manned a set of pre-prototype capabilities developed by ACT and deployed to Brussels for the experiment. These included:

- An experimental organisation focused on crisis management – the Crisis Management Fusion Centre;
- A suite of technical capabilities, including a physical computer network, servers, and computer applications that enable the exchange and sharing of information and communication – the Collaborative Information Environment, and;
- An interactive display of all relevant crisis information – the NATO Strategic Picture. (see Appendix A)

Together, these capabilities represented the experimental crisis situational awareness architecture. This architecture was used to evaluate the preliminary hypothesis derived from experimental findings of CMX 04. These findings pointed to the need for greater situational awareness for Headquarters decision-makers and staffs during a crisis. The hypothesis itself linked together these three pre-prototype capabilities in such a way to rigorously define their relationship to Alliance Decision Superiority and shared situational awareness.⁸

CMX 05 EXPERIMENT DESIGN

The experiment portion of CMX 05 was designed to be both parallel and non-disruptive to the exercise because experiments and exercises often have conflicting priorities and concerns – especially when very new ideas or early prototype capabilities are being tried for the first time. Exercises are focused on current-day or evolving procedures, and as such, place much of their emphasis on training and ensuring that all personnel are fully qualified and well versed in the procedures and capabilities being exercised. On the other hand, experiments are focused on exploring or proving new (and sometimes ill-defined) phenomena with an eye toward the future. Experimentation occasionally overlooks established procedures and creates an environment where trying new technologies or methods can be encouraged.

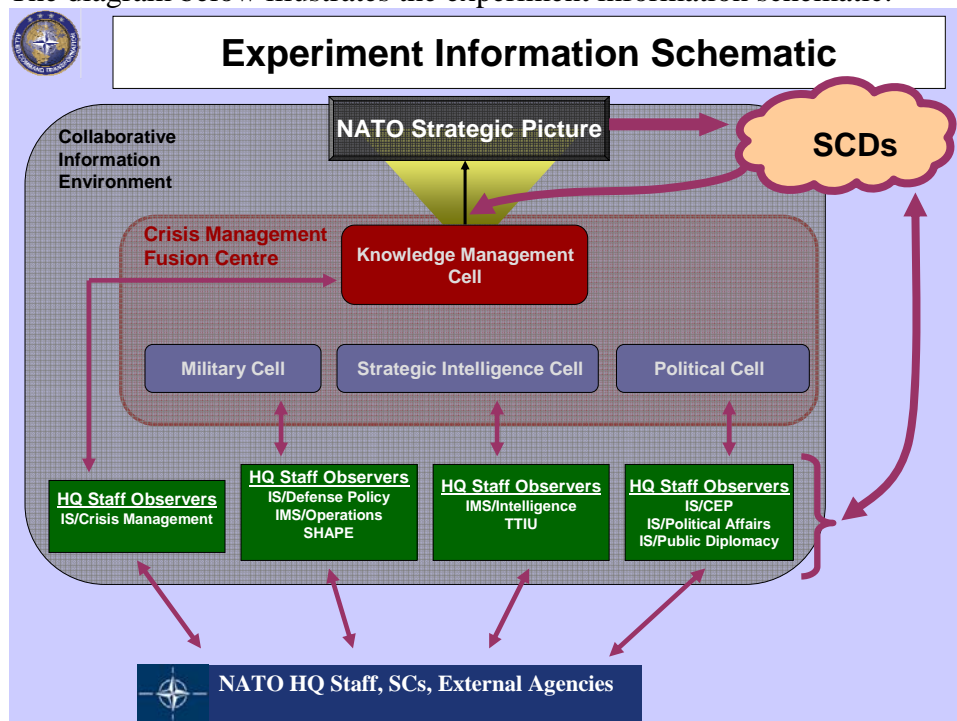
Experimentation in CMX 05 was conducted in parallel by using the same scenario environment as the exercise to hold as many potential variables constant as possible. By ensuring that experiment materials remained within the experiment environment and were not seen by exercise participants, exercise and training objectives were not disrupted. As experimental capabilities become more robust and more representative of acquisition-level capabilities, it is likely that future experimental efforts will feature more interaction between the exercise and experiment. The demonstration of advanced experimental capabilities could become part of the exercise objectives as they are placed

at the disposal of actual Headquarters users and used in the exercise environment. Indeed this was the case in the follow-on Fusion Centre Limited Objective experiment.

The CMX 05 exercise proceeded as events were injected by the directing staff through a variety of means, including message traffic and simulated news reports. The entire exercise consisted of three “decision-cycles” which began with staff work that supported committee recommendations by the Military Committee (MC), Political Committee (PC), Senior Civil Emergency Planning Committee (SCEPC), and Policy Coordination Group (PCG). These recommendations were then forwarded to the North Atlantic Council (NAC), where either decisions or taskings to Alliance bodies for further work were issued. Furthermore, the exercise included nine partners to practice how NATO could work together with them during a crisis. However, this significant element of exercise play was not examined during the experiment.

The CMFC had access to the same injects as exercise players and through each decision cycle, worked to build situational awareness using the tools and capabilities at their disposal. The “crisis rhythm” of the CMFC followed the decision-cycles of the exercise, and the CMFC worked to gather and post documents required by committees in a usable and intuitive format. They also worked to provide a global understanding of where NATO was in its own crisis management process, and worked to understand how scenario events may affect that process as they were injected. The NSP represented this information and was the embodiment of the notion of crisis situational awareness. This picture was viewed by the SCDs who provided recommendations about the fidelity of the picture, as well as advice on how to make this picture useful to high-level NATO executives.

The diagram below illustrates the experiment information schematic.⁹



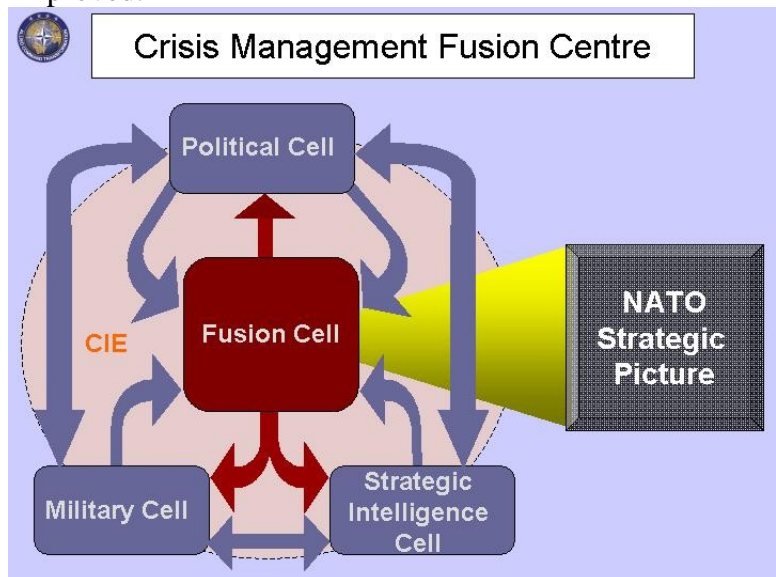
For the experiment, ACT deployed over 60 laptop computers, three file-servers, and two large screen displays, all of which were manned by a contingent of 50 people. This equipment was linked together in a network that extended across the NATO Headquarters campus and allowed the experimenters to work together in a distributed, yet highly coordinated fashion. This network, coupled with an experimental organisation and other prototype capabilities were a vehicle that allowed ACT to examine situational awareness within NATO Headquarters during a crisis.

OVERVIEW

The crisis situational awareness experiment was about the collection and depiction of crisis information. Concept developers understood the problem of generating the necessary level of crisis situational awareness to require not only new technologies, but also new processes to leverage those technologies, and a new (and dedicated) organisational structure to operate these systems. To explore all of these issues, ACT developed three propositions about how this could be achieved and served as the basis for experimentation efforts. These propositions were:

- If NATO establishes a cross-functional organisation then it will increase the value of information available during a crisis.
- If crisis management processes are conducted through the use of a CIE, then staff support to committees will be improved.
- If all relevant crisis information is presented in an accessible and intuitive picture, then viewers will share a better quality understanding of the crisis, NATO's posture, and potential options for Alliance response.

The pre-prototype Crisis Management Fusion Centre (CMFC), as depicted here, addressed the first proposition to create a specialized organisation focused on developing high-quality information about the crisis, and relating that information to NATO's crisis management process.¹⁰ The CIE addressed the second proposition, and used computer-based collaborative capabilities to support NATO's crisis management process in a more parallel and less sequential way. Finally, the NATO



Strategic Picture addressed the last proposition by attempting to represent the knowledge that was gathered, created, and fused by the CMFC within the CIE and transmit that understanding to the experiment audience.

The CMFC was organized in a cross-functional manner with political, military, intelligence, and knowledge management cells. These cells relied on a CIE to work together and communicate in a parallel fashion. Together, the CMFC, using the CIE, produced a prototype “NATO Strategic Picture” (NSP) that worked to accessibly and intuitively present all relevant information on the exercise’s emerging crisis. Putting the three propositions together in a preliminary hypothesis allowed experimenters to understand the causal relationships among the capabilities and provide scope for the experimental investigations. This hypothesis was:

If NATO Headquarters possessed a dedicated Crisis Management Fusion Centre, enabled by a Collaborative Information Environment (CIE), and capable of producing a NATO Strategic Picture, then it would enhance Alliance crisis situational awareness thus contributing to smarter decisions fed by the latest and most timely information.

The above hypothesis provided the basis for the experiment design. The functional CMFC cells gathered information and collaborated with one another within the CIE to create knowledge about the developing situation. The understanding developed in the cross-functional work of the CMFC cells was then transmitted to the Fusion Cell, who then worked to populate the NATO Strategic Picture, and ensured that the picture addressed the needs of the users (in this case, the SCDs). The NSP that was the main physical product that emerged from the Fusion Centre, and it was an intuitive, interactive view of the crisis situation. The NSP embodied the conceptual idea of crisis situational awareness.

THE CRISIS MANAGEMENT FUSION CENTRE

The CMFC was an experimental organisation located within NATO Headquarters. The CMFC has a daily focus on generating a detailed understanding of the international environment. It is a tool for NATO Headquarters to better prepare for and respond to emerging crisis situations by quickly building an integrated understanding of the dynamics of the crisis. The CMX05 CMFC was placed into one room of the CDH building on NATO Headquarters campus. This space placed the functional cells in very close proximity to one another even though they were also linked via the CIE. This physical co-location limited the exploitation of some of the deployed collaborative tools, but also helped demonstrate that a dedicated crisis management organisation that cut across the functional disciplines within NATO headquarters could add value to crisis information by allowing them to work together on complex issues that overlap traditional organisational boundaries.

As described in the book *Effects-based Operations*,¹¹ all operations occur within the context of three domains. Physical military actions take place in the physical domain,

these actions are detected and reported to higher authority in the information domain, and the decisions as to how to respond are made in the cognitive domain. Therefore, the success of the CMFC concept was eventually determined by its ability to create an effective link between the information domain and the cognitive domain by turning raw data and information into actionable knowledge to facilitate decision-making.

CMFC Findings

- The CMFC worked well in the artificial exercise environment of CMX 05 and improved crisis situational awareness through its product -- the NATO Strategic Picture (NSP).¹² Work within and among the functional cells demonstrated the value of a cross-functional organisation through its ability to collect, synthesize and display all relevant information. By the end of the experiment the CMFC was proficient at handling and fusing crisis information. However, fusion and creation of knowledge did not reach the level required by an operational system.
- Without good CMFC Knowledge Managers (KM) the product developed would simply be a website and document repository. Therefore well-trained and experienced Knowledge Managers (KMs) that also understand the Headquarters crisis management process with the ability to quickly digest and fuse information would be the types of personnel required for the KMs positions within the CMFC. Ideally, CMFC KMs would have experience at NATO HQ and an understanding of Alliance decision-making processes and procedures.
- The CMFC should be a standing organisation since there is usually very little time to stand up an organisation during a crisis. At a minimum, the key nucleus of the CMFC should be a standing organisation that gets augmented with Subject Matter Experts tailored to manage each unique crisis situation. This is necessary since a standing organisation is not only required to identify emerging crisis, but also to minimize the inevitable lag in information that would occur if the CMFC had to stand-up to meet a crisis. This lag could greatly affect the ability of the CMFC to begin the process of fusing information and providing the quality information required by the Nations for their deliberations on constructing a coherent approach to the crisis.
- Cross functionality may have application beyond crisis management operations only. As stated by a SCD during CMX05, "We may need a cross-functional way to operate, not necessarily a specialized cross-functional centre only. It might be more effective to get the organisation as a whole to work that way."
- Exercise artificiality due to the experiment's separation from the exercise hampered the development and analysis of CMFC capabilities. This separation also removed the CMFC from any inputs from its perspective users in NATO HQ. Therefore the only link the CMFC had to the exercise was through the staff observers.
- CMFC is broader in scope than NATO's current Situation Centre (SITCEN). According to its mission statement, the SITCEN collects and disseminates information¹³, however it does not have the cross-functional nature of the CMFC, nor dedicated knowledge managers to fuse information into a strategic picture.

Future experimental events should explore the relationship between the SITCEN and the CMFC.

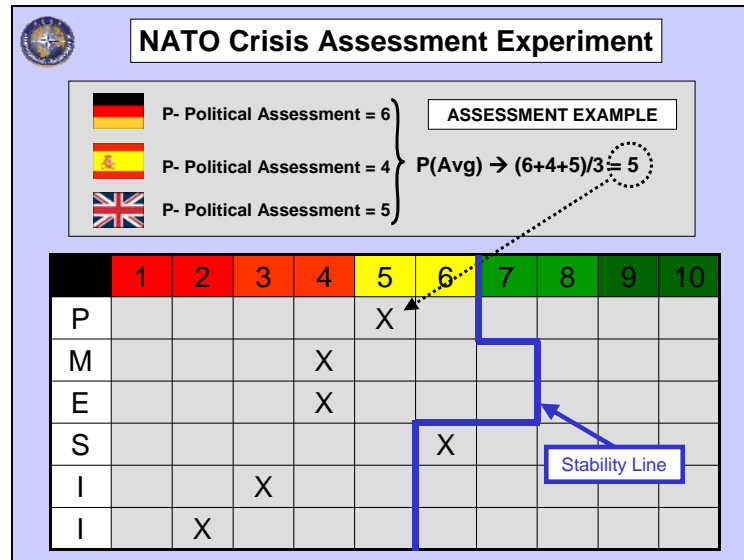
- The current Crisis Management Task Force (CMTF) conducts a staff function. As an ad hoc body, it acts as a coordinator in the HQ when the NATO Crisis Response Process is activated. The CMFC may be a significant enabler of Crisis Management Task Force operations when a crisis emerges by providing high-quality information about the crisis very early. CMTF members may plug into the CMFC and use the NSP as an aid to its coordination of Headquarters activities.

RECOMMENDATIONS

Upon completion of the experiment, the following recommendations were made:¹⁴

- ACT should determine if establishing more cross-functional business practices and processes enabled by a CIE can support both crisis management but also other daily business throughout NATO Headquarters, and understand the extent to which cross-functionality can be achieved in other areas within the Headquarters.
- The CMFC cell structure must be capable of covering the Political, Military, Civil, Economic, Technological, Physical, and Infrastructure areas.² This structure will provide a more holistic picture of the crisis, improve situational awareness, and line up the CMFC with an Effect-Based Approach to Operations.
- Proposed changes include:
 - Creating an Economic Cell that includes the Infrastructure area, and a Civil Cell that includes the Civil, Physical, and Technological areas.
 - Making the Strategic Intelligence Cell a supporting cell, since it feeds all other CMFC cells, or simply incorporating it into the other cells.
- CMFC likely requires at least two more staff members in the Fusion/KM Cell. CMFC lead suggested that these two members should include a Senior Leader (two-star or civilian equivalent) and a Subject Matter Expert (SME) on NATO HQ policy/procedures. Additionally, the KMs of the functional cells would, at the minimum, have to be subject matter experts in their functional areas and have extensive knowledge on how NATO HQ works. New Fusion Cell positions would dedicate themselves to information management, allowing the others to fuse information and create knowledge. If the number of functional cells increases, then the number of knowledge managers in the KM cell might also have to increase to match.
- ACT should further develop the embryonic Assessment Matrix for experimentation during CMX06. This assessment matrix could include the seven indicators used in CMX05 (Political, Media/Information, Legal, Geography, Economic, Social/Civil and Technology) or the areas used in NATO Net Assessment. ACT should also investigate the possibility of obtaining national

inputs to the assessment matrix to create a 'NATO' assessment vice a 'NATO Headquarters' assessment as seen in the figure below.



- This domain assessment should be made and owned by someone outside of the CMFC. This could be in Intelligence, NIWS, SHAPE Planners, etc. The CMFC's function should be to coordinate with whoever controls the assessment when new issues arise that the CMFC evaluates could have an impact on the assessment. Experimentation with an updated CMFC in future events should be part of the exercise (if possible). This would allow for better analysis and assessment of its capabilities by operating it in a more realistic environment.
- Future ACT efforts must include informing, encouraging and involving NATO Headquarters committees and staff elements on the development of the CMFC. This partnership with potential users of the CMFC will facilitate further concept development by encouraging ownership of the product to the customer.
- Begin development of standard operating procedures and terms of reference for the CMFC. These documents should be working drafts and should provide experimenters with some guidance while allowing them flexibility to try new procedures and modify the procedures and terms of reference to improve the concept.
- While direct contacts or links to operational level units should not usually be sought by the CMFC through the CIE, increasing political involvement in the operational areas, for example, the placement of a Senior Representative of Secretary General in Afghanistan, point to the necessity of some connection. However, the CMFC must be cautious since these links could be seen as bypass the authority of the Military Committee (MC) and Strategic Commanders.

COLLABORATIVE INFORMATION ENVIRONMENT

The CIE is the central enabling capability for cross-functional, knowledge-centric organisations such as the CMFC. It allows for the access of information and communication among widely dispersed locations and supports shared situational awareness. The CIE allows knowledge managers and other staff within the CMFC to locate the information needed to support the crisis management process, by fusing it and placing it within the NATO Strategic Picture in a context that is useful for decision-makers. Ultimately, it allows all relevant elements within NATO Headquarters to communicate and collaboratively construct a common view of all international factors in a crisis, and encourage the simultaneous and parallel construction of materials needed by decision-makers.

The Collaborative Information Environment used during CMX05 consisted of a network of 60 computers with its own servers and linked into the NATO Headquarters system. This system included collaborative tools such as E-mail, Messenger (voice and text), “Click to Meet Express,” and Xythos (Document Management Tool).³ Throughout the experiment, the CIE succeeded in enabling the cross-functional work of the CMFC. Many Headquarters visitors who toured the experimental CMFC saw great potential for CIE capabilities to support NATO Headquarters operations in a wide variety of areas.

Findings

- A collaborative system such as that used by the experimentation team during CMX 05 would improve the handling and flow of information in NATO Headquarters during a crisis. However the collaborative system should not be used solely for crisis management. Since in military parlance “people should train as they fight,” the CIE should be used routinely so that technical capabilities available during a crisis are also used on a routine basis.
- CIE tools were used extensively for communications between the CMFC and the observers and SCDs located within NATO Headquarters. The potential of these collaborative tools to support operations within the building was manifest. Since the CMFC cells were located together, some functions such as “Click to Meet Express” chat room were abandoned in favour of face-to-face communication within the CMFC itself. However, other CIE functions, such as document storage and sharing were critical for CMFC operations. This illustrates the idea that a collaborative environment is more than a technological solution, and that one important element of a collaborative environment that encourages cross-functionality may be the location of dedicated crisis managers together.
- The capabilities of the CIE were not fully exploited due to the co-location of the CMFC cells. The benefits of the CIE tool cannot be exploited without proper business processes and practices. If people do not work collaboratively, they would receive little or no benefit from the tool. Any future concept development

must ensure that the CIE includes proper training of people and the development of processes and procedures.

- If exploited to its fullest, a CIE will enhance parallel and cross-functional work. This was demonstrated in CMX05 through the NSP. It demonstrated the value of parallel and cross-functional work.
- If NATO Headquarters wishes to implement a CIE capability it needs to greatly improve its network connectivity. While it could currently support a CIE, it does not have sufficient bandwidth to support many of its tools, i.e. voice communications.

RECOMMENDATIONS

- A CIE should be deployed to NATO Headquarters as soon as possible, independent of the CMFC and NSP. While a CIE might not force the Headquarters to operate cross-functionally as envisioned by the CMFC concept it will enable personnel to become familiar with the CIE tools required for the CMFC and enable a smoother transition to cross-functional organisation arrangements and working practices.
- The organisation and labelling (i.e. title, subject line, etc.) of information on the portal should be better structured. The filing structure in CMX05 had too many layers, the documents were not listed logically, and the names of files were not content oriented. This created confusion and unnecessary work for the CMFC that took valuable time away from creating knowledge. This organisation should also include a method to flag information so that critical new info is noticed when it enters the system.
- The CIE should include technical enablers like a web camera and access to the unclassified Internet. Both of these are knowledge enablers, but require research into how to deal with security classification issues. (i.e. placement of cameras in a classified environment, links to the Internet from a classified network, etc.)
- NATO HQ network should be upgraded to enable greater band-width in order to exploit the full capabilities of a CIE. Network connections should also be expanded to include all meeting rooms to allow for direct connections to the CIE and its information while holding meetings. This could decrease discussions tabled because of a lack of information about the crisis or technical procedures that would be readily available within the CIE.
- The Collaborative Information Environment should be renamed NATO Collaborative Environment (NCE) to reflect a potentially wider role for the concept in NATO Headquarters.

OVERALL POLITICAL STRATEGIC CONCEPT FINDING

The key political-strategic concept finding for CMX 05 was that Decision Superiority is a useful, yet inadequate conceptual perspective for NATO Headquarters operations during a crisis. While, this concept was of great value during early concept and prototype work

done by ACT, a significant problem emerged when considering the unique political-military environment there and the challenges of deriving consensus among 26 nations when faced with a fast-moving crisis situation. First, the concept characterized better or faster decisions in comparison with those of an adversary. This focus on potential threats or adversaries is problematic if the adversary is not clearly defined, such as a transnational terrorist organisation, or if NATO is conducting peacekeeping or peace-enforcement operations. Furthermore, this relative definition of Decision Superiority is extremely difficult to quantify if the scope, level of ambition, or time-scales of adversary objectives are substantially asymmetric relative to those of the Alliance.

Gathering the requisite understanding of an adversary's decision-making process, measuring and quantifying that cycle, and then comparing it to NATO's own decision-making would require a significant investment in experimental capabilities and an experiment campaign to investigate each of these issues. The question that immediately arises given is, given this level of effort, what capabilities would result from such an investigation? This focus on the relative level of decision superiority between NATO and a potential adversary meant that the capabilities, competences, and strengths that the Alliance asserts on behalf of its members in an international situation were discounted or absent from the concepts. What was missing was a vision of what the concepts and pre-prototypes could do – not relative to an adversary – but to support large-scale political-military goals that the Allies wish to achieve when turning to NATO.

The first Senior Concept Development seminar allowed SCDs to grapple with this issue early in CMX 05 experimentation. This seminar revisited the idea of Decision Superiority in the specific context of the political-military NATO Headquarters environment. The unique capability that NATO Headquarters brings to crisis management is its capacity to develop consensus positions in conjunction with the potential for collective action among 26 nations. The Alliance enhances the security and strength of its members through its consultation and decision-making process that results in a coherent decision reflecting the will of all the member-states. The SCDs labelled this solidarity among Alliance members *Decision Coherence*. The idea of Decision Coherence replaces Decision Superiority at the political strategic level, and gives a sense of the goals and capabilities that the Alliance requires to transform itself.⁴ Therefore NATO political-strategic decision support capabilities must not only support rapid decisions of high quality as SCDs discovered in CMX04, but they must first and foremost support the ability of the Alliance to achieve coherent decisions agreed to by all the member states.

This new Decision Coherence idea provides guidance to concept developers indicating what political-military capabilities should do. Achieving enhanced situational awareness, then should forgo measuring situational awareness relative to an adversary state of awareness, but rather, should work to enhance the coherence of decisions among the 26 Nations.¹⁵ Military-strategic and operational planning then follows, and is significantly enabled by coherent decisions from the top. Decision Coherence will provide clear lines

of what can and cannot be done, and what is agreed to by the nations in a transparent and readily accessible way. Keying the CMFC and its supporting concepts to the idea of enhancing decision coherence provides a clear target capability that strikes directly at the challenges of making decisions in this environment.

Experimental capabilities should be able to aid the Alliance to quickly understand the nature of the crisis or other international problems, to better understand the state of agreement or disagreement among the Allies, to encourage coherent decisions more quickly if the potential for agreement exists, and perhaps enable those decisions with more precise and detailed information than ever before. The history of Alliance crisis management hints that better decisions may take longer at the political-strategic level and where the perspective provided by the decision superiority concept may hint at discarding capabilities that are less rapid; the “coherence” concept framework indicates that speed is not the sole arbiter of success at NATO Headquarters. Hence, while an important secondary effect of strategic military capabilities might be to make the same decision faster, the primary goal is to enable a more coherent and durable decision altogether. This concept was explored further during the Fusion Centre Limited Objective Experiment.

FUSION CENTRE LIMITED OBJECTIVE EXPERIMENT

As a follow-on to CMX 05, ACT ran a limited objective experiment in Allied Command Transformation (ACT) conducted the Fusion Centre Limited Objective Experiment (FCLOE) at the NATO HQ Situation Centre (SITCEN) from 5 to 16 September 2005. The FCLOE was a Political-Strategic level Decision Coherence experiment and was the third time that ACT conducted experimentation at NATO HQ to investigate new methods to support consensus-based decision making.

Unlike previous experiments at this level, the FCLOE used real-world crisis information from ongoing NATO operations in Afghanistan and emerging relief efforts in response to Hurricane Katrina. The FCLOE used these ongoing and emerging operations as sources of information to test the potential of nascent crisis management capabilities. This work was a critical step for ACT to carry forward the experimentation findings from CMX 05 and sufficiently mature the crisis situational awareness pre-prototypes for further experimentation in CMX 06. Additionally, the FCLOE served as a convenient platform to demonstrate these emerging transformational capabilities to the Secretary General, Permanent and Military Representatives, and all interested members of the NATO Headquarters staff in a demonstration on the last day of the experiment.

There were three stated aims in the experimentation plan of the FCLOE:

- To continue transforming the Alliance in the context of EBAO;
- To build on previous experiment insights and observations in order to develop prototype capabilities in support of Decision Coherence; and
- To enhance Shared Situational Awareness in NATO HQ.

These aims were translated into three plans, one with its own sub-plans:

- Crisis Situational Awareness
 1. Crisis Management Fusion Centre (CFMC)
 2. NATO Strategic Overview (NSO)¹⁶
 3. Collaborative Information Environment (CIE)
- NATO Systems of Systems Analysis
- Key Assessments Page

The FCLOE was intended as being a bridge between fusion centre experimentation that took place in CMX05 and the experiment to take place in CMX06. The FCLOE used the Afghanistan parliamentary elections as the input to the Crisis Management Fusion Centre (CFMC) whose output was the NATO Strategic Overview (NSO). This was in contrast to CMX05. The goal of the NSO was to increase crisis situational awareness within NATO HQ so as to achieve decision coherence.

As was the case in CMX 05, the CFMC was a cross functional organization whose mandate was to collect, coordinate, fuse and post all relevant information pertaining to a specific crises. For the LOE it was manned by a series of military officers largely from operational backgrounds. The CFMC's product, the NSO, was a web portal similar to Command View with a mixture of text and graphics on an applicable crisis.

It was expected that since the FCLOE was an intended as a step between CMX05 and CMX06 that the LOE would build upon the lessons learnt in CMX05. Unfortunately, this did not happen with respect to internal CFMC procedures. Training before the LOE consisted of two days of Power Point presentations and some sessions on how to use the CIE tools. However, there was no clear delineation of roles and responsibilities and how information would flow within the CFMC to achieve fusion and knowledge creation. This was particularly frustrating for the two Canadian participants who had been at CMX05 and who thought they would build on CMX05 procedures. They were not able to do this largely due to tool changes that made CMX05 procedures largely unusable. While procedures were eventually developed, they were perhaps not as good as they could have been and took much longer to develop than they should have (a week).

A further impediment to the development of CFMC procedures was competing priorities for the attention of the CFMC KM chief. The KM chief was responsible for supervising CFMC processes and also for the network hardware and software supporting the CFMC and NSO. At the end of the first week of the experiment, the experiment director, decided to change the objective of the experiment to one of demonstrating the NSO to NATO HQ. This meant that significant amounts of the KM chief's time and effort were taken up in preparation for the demonstration and not developing the CFMC processes. Additionally the NSO was originally intended to only cover the Afghan parliamentary elections but during the experiment the NSO was expanded to cover NATO support to the Hurricane Katrina relief efforts.

In the end, the CFMC did achieve information fusion and knowledge generation. The outcome was that the CMFC succeeded in creating, displaying, and maintaining a useful and relevant NATO Strategic Overview for two events: the ongoing operations in Afghanistan and the emerging NATO relief efforts for Hurricane Katrina. According to several permanent representatives and military representatives who received a demonstration of the capabilities, a CMFC located at NATO HQ would make a strong contribution toward enhanced decision coherence and effectiveness. That said, one of the main concerns raised was over issues of trust. In other words, who would be responsible for making judgments about the key assessments? This was viewed as a critical issue.

Because the tools that will be used in CMX06 will be the same as those used for the FCLOE, it is expected that the difficulties encountered with the processes in FCLOE will not occur during the next iteration. What has become clear, however, is that business processes, training and trust are just as important as the tools that are used.

CONCLUSION

In closing the purpose of this paper has been to show how NATO is using experimentation to transform decision making processes at the highest levels. Due to the paper's length restriction, not all important areas could be explored; however, it has become apparent that ACT will continue to develop a sustained experimentation campaign to ensure that every experiment builds on the findings of prior work. Future ACT experiments and engagements in NATO exercises and operations at all levels are leveraging a growing body of data and analysis and are building upon the acquired experience from this year's experiments. This experimentation campaign will be the basis for the development of experimental concepts such as those used in CMX 05 and the FCLOE into full hypothesis experimentation, and later, demonstrations. Although further exploration of a concept can be a result of an experiment, the ultimate goal of experimentation is to field real capabilities that improve the performance of the Alliance for its members. Already, ACT's activities are showing how effective experimentation can be for achieving this goal.

APPENDIX A ¹⁷

The NATO Strategic Picture (NSP) is a common overview of all information relevant to decision-making at the political-strategic level. This picture fuses crisis information, intelligence data, and other relevant information understood by the Alliance and relates this information to the internal NATO processes used for arriving at consensus on a particular issue. The picture displays key events that may have an effect or level of influence on NATO's analysis of a situation, while presenting areas of difference or conflicting information so that decision-makers may focus their attention on problem information areas. This information must also be presented in a way that is focused on the users, is intuitive, and facilitates a speedy comprehension of the situation. The picture must also be flexible enough that information and knowledge can be tailored to meet the unique requirements of the particular crisis.

For CMX 05, the NATO Strategic Picture consisted of a series of linked web pages that depicted the relevant issues. The picture evolved as the experiment progressed, and this description is that of the picture as it was on the last day of the crisis. The NSP consisted of:

- The NSP homepage
- A "Today's Events" headlines page
- A "Crisis Status" page
- A "Current Situation" page
- A timeline page
- A map depiction page
- A regional background page
- A "Key Assessments" page

The NSP Homepage

The NSP homepage provided – at a glance – a brief overview of NATO's posture and the global situation. The page was divided into four "clickable" sections. The first portion listed each crisis event being monitored by the Alliance. Although only the exercise scenario was populated here, in a live system, each link to a crisis would be populated with real-world data. The link to the Eridor crisis provided access to each of the subsidiary pages listed below, such as the "today's events" page. The second portion of the homepage included a global snapshot, which listed global events in four categories: deteriorating, improving, status quo, and terrorist threats around the world. A third column depicted NATO force status changes, such as deployment data for NATO forces, or changes in status of ready forces. This column also included current intelligence warnings, and strategic events that may influence NATO's force status or posture. The fourth section included a schedule of committee or working group meetings with date and time, and a countdown intended to impart a sense of urgency for experiment personnel to gather and populate the relevant documents that would support a meeting (but because of the parallel nature of the experiment, were viewed by SCDs). Each of these meeting

entries included a link to preparatory documents for the upcoming meeting. Finally, the NSP homepage included an “alert” popup window that presented users of the NSP time-sensitive or highly valuable information about the crisis. Often, this alert window was used to push information about a terrorist incident, or changes to committee scheduling. A record of alerts was available, should the user have missed several alerts while away from his or her computer.

All elements within the NSP included a date-time stamp that indicated the last update to the information presented on the page.

Today’s Events (Headlines) Page

By clicking on the relevant crisis link on the homepage, users were led to the “Today’s Events” page, which indicated critical information on daily NATO Headquarters activities related to the evolving crisis. The top portion of this page listed the critical “headlines” impacting the crisis, outstanding silence procedures or breaks of silence, as well as deadlines for delivery of particular documents. The concept of this area was to provide a bulletined list of events, issues, or recommendations or decisions from recent meetings that had an impact on the day’s events for other committees or working groups.

Adjacent to this block was a synopsis of that morning’s exercise crisis management task force meeting. This synopsis allowed the CMFC to focus its activities on committees with upcoming work and understand at a very early point in time, the upcoming issues of the day. Furthermore, because it was posted to the NSP, this information was available to all users of the system.

The headlines page included two portlets that pulled data from other HQ web pages, including scheduling data from the conference room managers that indicated the location of critical meetings. A second portlet drew a chronicle record of activity from the NATO Crisis Response web page and helped the CMFC track the movement of NATO crisis response options through the Headquarters process.

Finally, the headlines page had three logs (located at the bottom of the page) for each of the functional cells (military, political, and strategic intelligence) of the CMFC. The cells used these logs to post items of interest from their functional area that may be of interest to the entire CMFC. For example, the intelligence cell posted raw information on the interrogation of a captured terrorist with information related to an impending attack. This information could then be seen by the entire CMFC and pushed to relevant authorities. These logs also had a link to the latest daily briefing from each cell and an archive of previous daily logs and briefs.

Crisis Status Page

The crisis status page constructed for CMX 05 had two parts. The core element of the page was a graphic overview that illustrated the five-phase NATO crisis management process. This process chart was illustrated with arrows and text that related the

“theoretical” process to the evolution of the specific crisis by showing significant decisions as well as the position of the current phase within the current process framework. Each block was “clickable” to allow a more detailed view of the sub-processes in each phase.

The second chart was a figure illustrating the current phase of the crisis process, with the relevant committee meetings, required inputs, outputs, assessments, and decisions with that particular phase of the crisis. Each step in the process was “clickable” and opened a window that contained all relevant agendas, working papers, decision sheets, or other materials required in that step of the crisis management phase. These links were coloured differently depending on whether documents were available, incomplete, or in final draft. This page allowed all users to picture, in a graphic and intuitive sense where one was within the phase, to quickly locate required documents, or to understand what materials were either missing or incomplete.

Current Situation Page

The concept for this section was to provide updates on the status of the crisis focused outside the NATO HQ crisis response system. The current status page is broken into four sections. The first section pulls the daily “SHAPE Rolling Picture” into a portlet. This section illustrates SHAPE’s overview of the situation and a snapshot force laydown within the crisis area. This NATO involvement section also provides SHAPE situation reports, and links to national military and partner military situations, and a link to the SHAPE SDC home page.

A second section is a portlet to the NATO Intelligence Warning System (NIWS). The NIWS is independent of the CMFC, and is a system that allows nations to transmit their assessment of a crisis situation to Allies with an agreed methodology and symbology. This section also provides an update if any NIWS indicator changes, and a link to the report explaining the change in NIWS status.

The third section of the crisis situation page describes the situation in terms of international and nongovernmental organisations. A map shows the laydown of known UN or NGO personnel or facilities in the area. This section of the page has links to relevant U.N. Security Council resolutions and political statements by Allies, Partners, or NGOs.

The final section provides updates from the Terrorist Threat Integration Unit (TTIU). It was also used as the repository for media clips from simulated television reports on crisis events.

Timeline Page

The concept of this page was to provide a tool, visible to all users, which presented an overview of scheduled meetings, external constraints and suggested decision points relative to the crisis. This is an important aspect of increasing situational awareness in

the Headquarters by illustrating dependencies among the meetings and decisions. For example, a NAC decision must be supported by a number of committee meetings, which may be impossible to properly schedule during a fast-moving crisis. This information allows decision-makers to either compress the timeline, or remain on the same timeline and assume the risk of a more lengthy decision process. The timeline shows scheduled meetings, meetings required but not yet scheduled, NATO decision points and phases along the NATO crisis management process, decisions taken by the NAC, and actions due from the various committees.

Map Depiction Page

The map depiction page provided a variety of geospatial materials, including a military situation display of the crisis area, images of facilities within the area, medical, and NGO laydowns. None of these map displays incorporated an active Common Operational Picture or other interactive displays, but these could be incorporated in this section in a future “live” NSP.

Regional Background Page

The background page provided a summary of the current crisis situation. This summary linked to a lengthier document that could be accessed if CMFC personnel required more information. This text was set next to a map of the region, and linked to background documents that described the geography, economy, infrastructure, politics, demographics and other significant data on the particular nation. Additionally, the page linked to personal profiles of significant actors in the crisis, including government officials within each state, and transnational actors that have some influence over the development of the situation.

Key Assessments Page

The key assessments page was a very early experimental tool to help CMFC members understand the crisis in terms of progress towards achieving NATO’s desired endstate. During the experiment, the three functional cells conducted this assessment, however it is envisioned that ownership for the assessments would be given to experts working throughout NATO or to selected “centres of excellence” outside it (if required) to provide each assessment. This page organized a combined assessment based on seven indicators, which were:

- Political
- Media/Information
- Legal
- Geography
- Economic
- Social/Civil
- Technology

These elements were assessed on a graduated scale from 1 to 10, in three domains. These domains were favourability of the situation to the Alliance's endstate, stability of the situation, and ability of NATO to influence. The CMFC members placed a line on the matrix that illustrated the desired end-state for NATO's engagement in each of these areas and displayed a symbol illustrating the current status relative to that end-state. Each cell was responsible for one or more of the indicators, and would change it as the situation improved or deteriorated. Furthermore, this change was highlighted so that users could quickly see changes in status upon reviewing the page.

¹ Fusion Centre Limited Objective Experiment Report. December 2005. Allied Command Transformation. Norfolk, Virginia.

² www.nato.int

³ Definition of an Effects Based Approach to Operations based on ACT's draft Concept for Alliance Future Joint Operations, Chapter 3. (Second Draft, 18 February 2005)

⁴ CMX 2005 Final Report., p 17

⁵ NATO CMX 04 Decision Superiority Experiment Report.

⁶ "Decision Superiority is the state in which better-informed decisions are made and implemented faster than an adversary can react." Allied Command Transformation, Decision Superiority Concept Primer. (November, 2004)

⁷ Crisis Management Exercise 2005, Final Report. ACT, Norfolk 2005. pg 9.

⁸ The Senior Concept Developers defined Decision Superiority as "better decisions, faster" during the CMX 04 experiment. From NATO Crisis Management Exercise 2004 Decision Superiority Experiment Report. (March 10, 2004). The importance of shared situational awareness and the requirement for an NSP can be found in ACT document, *A Conceptual Framework for Decision Superiority* (November 2004), p. 10

⁹ CMX 05 Information Overview Brief, January 2005. NATO HQ.

¹⁰ CMX 05 Trifold Brochure. January 2005. produced by ACT, Norfolk

¹¹ Edward A. Smith, Effects Based Operations: Applying Network Centric Warfare in Peace, Crisis, and War. Command and Control Research Program. 2002.

¹² The *Conceptual Framework for Decision Superiority* defines the NATO Strategic Picture as the conceptual product of the crisis management fusion centre that will enable Situational Awareness by displaying the current understanding of the evolving crises and the strategic environment

¹³ SITCEN General Information Brochure. Looking Beyond the Horizon. 2005. NATO HQ, Brussels.

¹⁴ Crisis Management Exercise 2005 Experiment Final Report, April 2005. Prepared by ACT Crisis Management Exercise Team, Norfolk, VA.

¹⁵ Coherence is defined as a systematic or logical connection or consistency, and the integration of diverse elements, relationships, or values.

¹⁶ During the course of CMX 05, the SCDs decided that sharing the picture of a situation among decision makers is a necessary, though not sufficient, condition for achieving enhanced decision coherence and effectiveness. Decision makers absorb information, recognize knowledge and arrive at an understanding in a cognitive process that combines analysis with intuition and experience. It is a complex behavioral process in which people combine rational and behavioral activity to produce decisions and actions. In each step of the decision making process, executives and staff mentally visualize both the current situation and an envisioned future state of affairs. Machines can never replace many forms of political communication, but a well-designed and adaptive NSO could enhance the effectiveness of all forms of human interaction.

Therefore, the SCD advocated changing the name from NSP to NSO.

¹⁷ As described in the CMX 05 Final Report, April 28th, 2005.

DEFENCE



DÉFENSE

Achieving Decision Superiority at NATO Headquarters

Ms. Orrick White

Centre for Operational Research and Analysis

Canadian Department of National Defence

White.om@forces.com



Defence R&D
Canada

R et D pour la défense
Canada

Canada

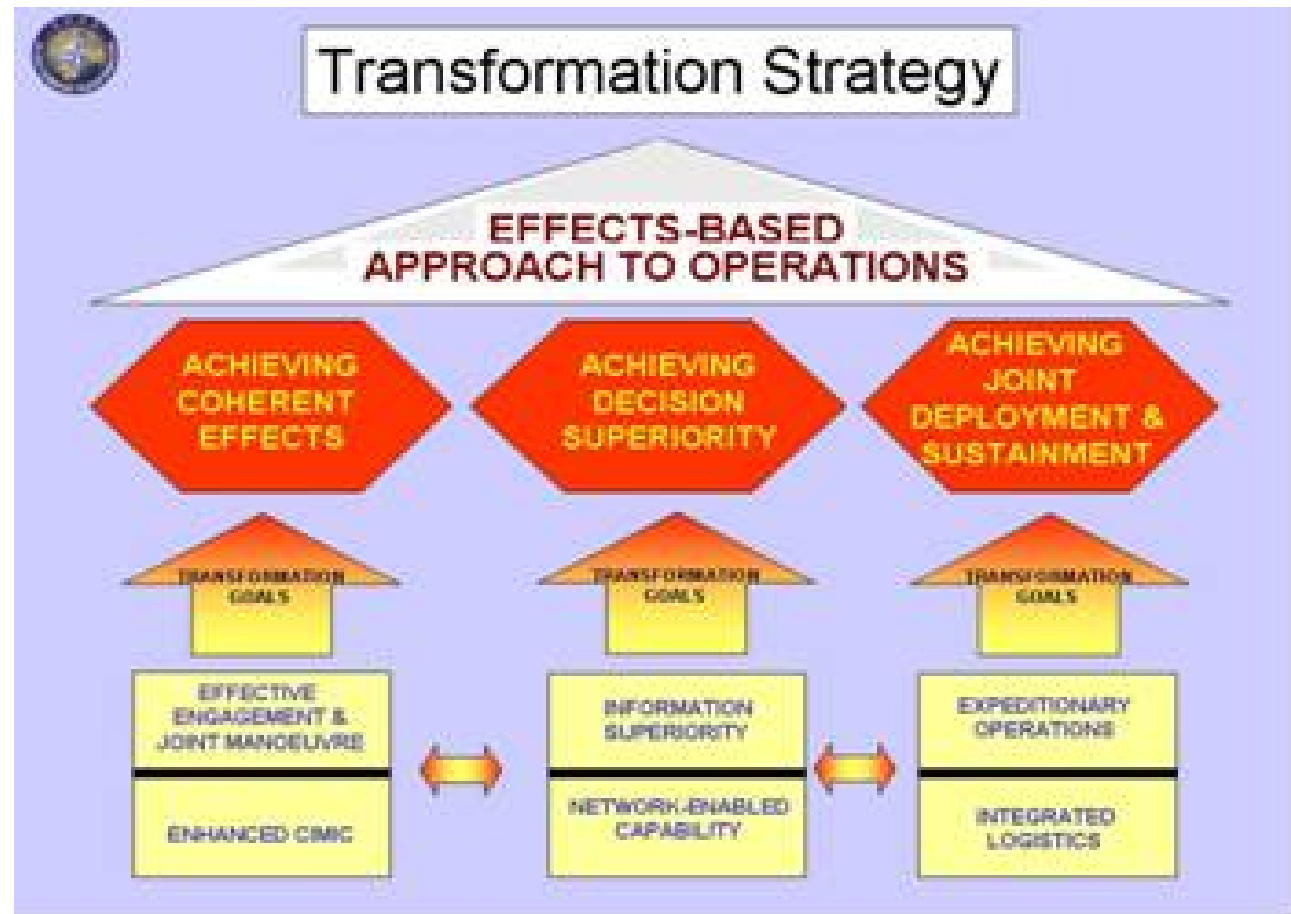


Outline

- **Introduction**
- **Concept Development and Experimentation**
- **Crisis Management Experiment (CMX) 05**
- **Data Collection and Analysis**
- **Objectives**
- **Overview**
 - **CMFC – Crisis Management Fusion Centre Concept**
 - **CIE- Collaborative Information Environment**
 - **NATO Strategic Picture**
- **Political Strategic Concept Finding**
- **Fusion Centre Limited Objective Experiment**
- **Conclusion**



Concept Development and Experimentation at the Political/Strategic Level



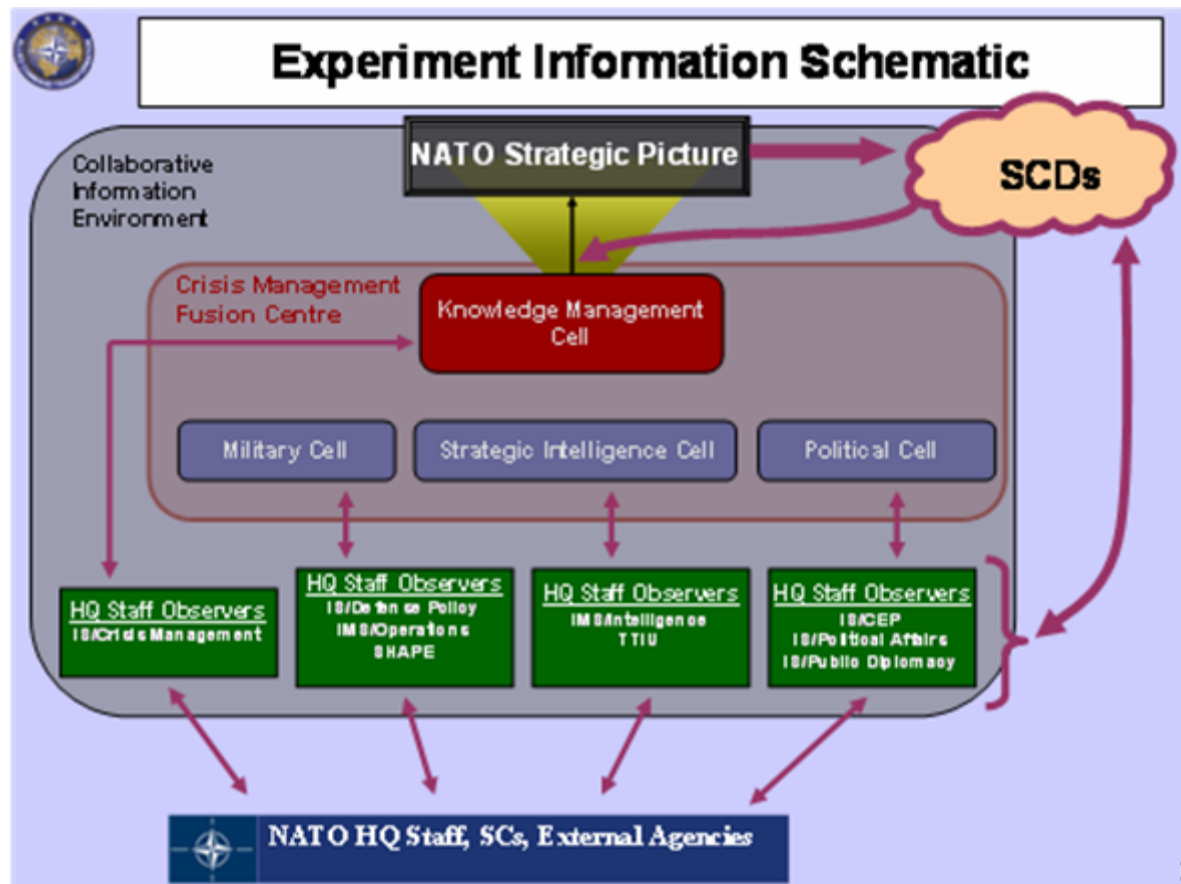


Crisis Management Experiment 05

Aim:

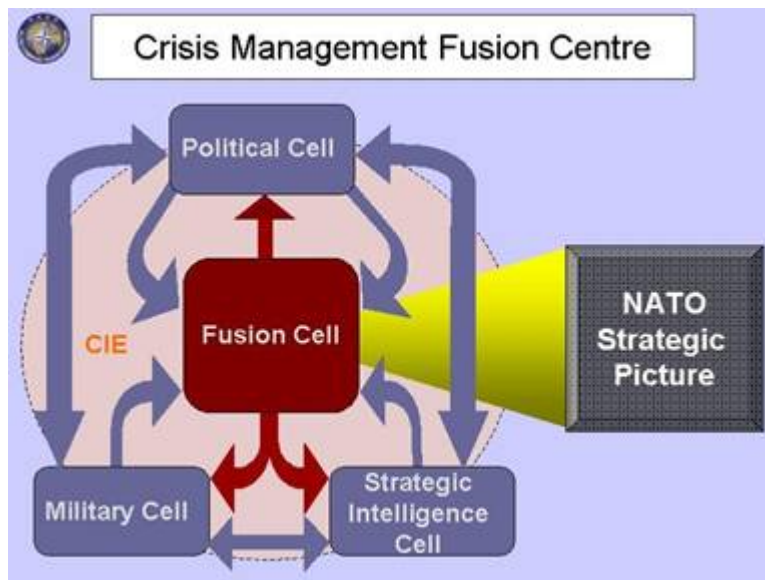
To examine the potential of experimental concepts to transform Alliance consultation and decision-making procedures and arrangements related to NATO crisis response.

CMX 05 Experiment Design





CMFC





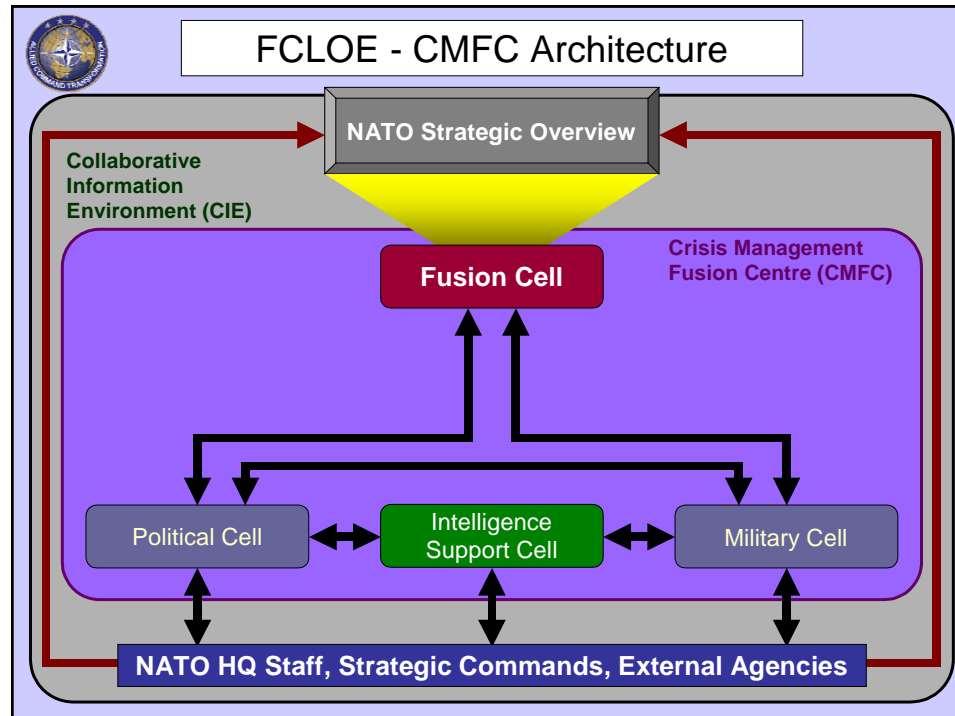
Fusion Centre Limited Objective Experiment (FCLOE)

Aim:

Examine the potential for experimental concepts to enhance shared situational awareness at NATO Headquarters.

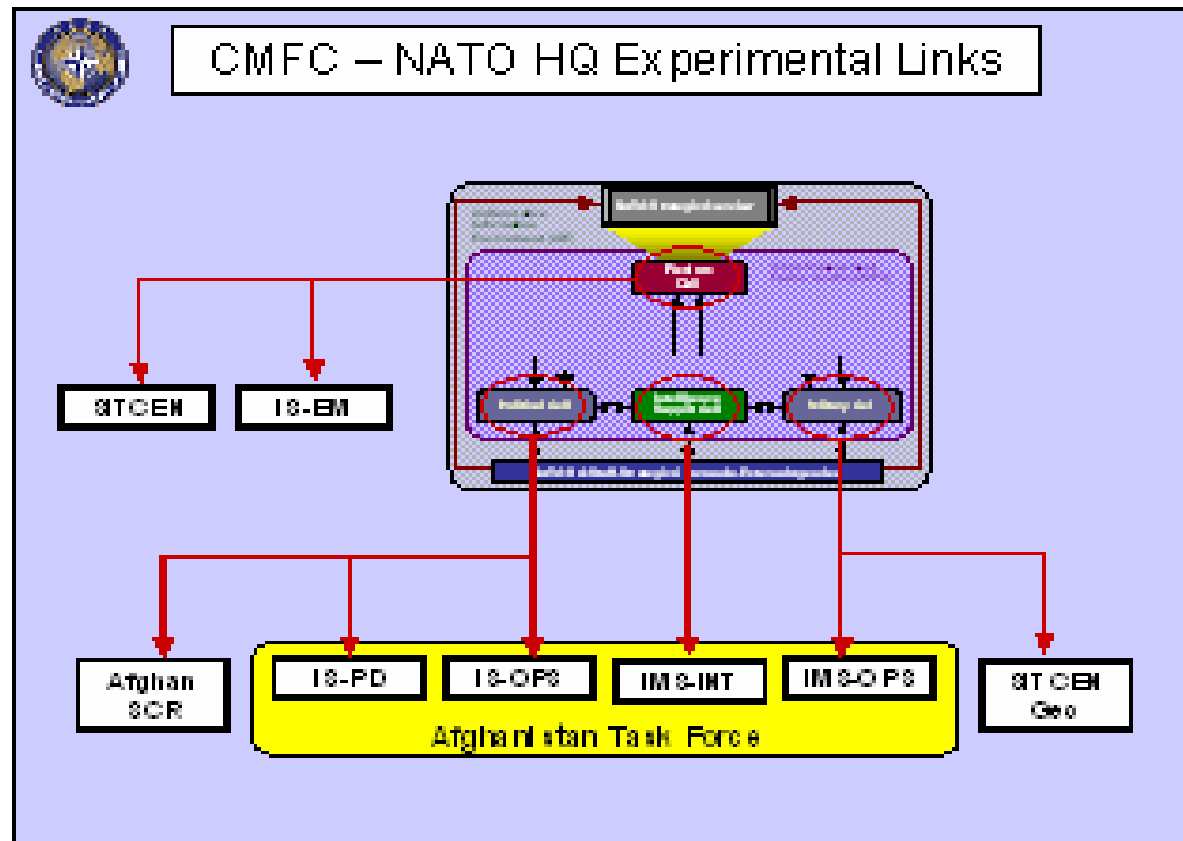


FCLOE – CMFC Architecture





CMFC – NATO HQ Experimental Links





Conclusion